CLAIMS

What is claimed is:

1. A circuit comprising:

a bus for communicating data;

a microprocessor for processing data, said microprocessor coupled to said bus;

a programmable functional component coupled to said bus, wherein said programmable functional component includes a plurality of functional blocks programmable to provide a plurality of functions and configurations; and

a memory for storing data including information associated with said functions and configurations, said memory coupled to said bus.

2. The circuit of Claim 1, wherein said programmable system on a chip functional component includes:

a programmable interconnect for coupling components to said bus;

an analog functional block configurable to perform analog functions, said analog block coupled to said interconnect; and

a digital functional block configurable to perform digital functions, said digital block coupled to said interconnect.

3. The circuit of Claim 1 further comprising a programmably configurable external communication port for communicatively coupling with external devices.

4. The circuit of Claim 1, wherein said memory stores a plurality of configuration images that define the configuration and functionality of said circuit.

5. The circuit of Claim 4, wherein said circuit is automatically reconfigured by activating different ones of said plurality of configuration images based upon the existence of a predetermined condition or event.

6. The circuit of Claim 5, wherein activating said different ones of said configuration images results in different values being loaded in configuration registers included the circuit.

7. The circuit of Claim 4, wherein said configuration images comprise:

user module personalization data for defining the functionality and configuration of a component included in said circuit;

parameterization data for defining parameters for said component;

application program interface (API) information for defining an operation of said component; and

user code for defining functionality of said component.

8. The circuit of Claim 4, wherein a first configuration image and a second configuration image include a copy of the same user program.

9. The circuit of Claim 4, wherein a first configuration image and a second configuration image include pointers that point to a user program and relevant information from the user program is loaded into the configuration registers when the respective image is activated.

10. An electronic device dynamic configuration method comprising:

loading a plurality of configuration images a memory of said electronic device;

configuring said electronic device in accordance with a first configuration image;

performing functions in accordance with said first configuration image;

reconfiguring said electronic device in accordance with a second configuration image; and

executing functions in accordance with said second configuration image.

11. The electronic device dynamic configuration method of Claim 10 wherein said reconfiguring of said electronic device in accordance with a

second configuration image is performed in response to a predetermined condition or event.

12. The electronic device dynamic configuration method of Claim 10 wherein said electronic device is a programmable system on a chip (PSoC).

13. The electronic device dynamic configuration method of Claim 10 wherein said first configuration image and said second configuration image define different functions and configurations for components of said electronic device.

14. The electronic device dynamic configuration method of Claim 10 wherein each of said first configuration image and said second configuration image includes information associated with selections of users modules for each one of the plurality of configuration images, allocations of hardware resources of said electronic device to the selected user modules, parameterizations for the selected user modules, and connections between the selected user modules and to other electronic device components.

15. The electronic device dynamic configuration method of Claim 10 wherein said first configuration image is associated with functions direct at normal or standard activities of a particular application and said first

configuration image is automatically loaded into configuration registers included in said electronic device.

16. The electronic device dynamic configuration method of Claim 10 wherein said second configuration image is associated with functions direct at special activities of a particular application and said second configuration image is automatically loaded into configuration registers included in said electronic device.

17. A method of programming an electronic device comprising:

a) selecting a set of user modules for a first circuit design system from a plurality of user modules;

b) allocating hardware resources of said electronic device to said set of user modules;

c) parameterizing said set of user modules;

d) connecting said set of user modules together and to external pins of said electronic device;

e) generating a first configuration image based on a user source program and based on information from said a) - d), said configuration image to be loaded into said electronic device; and

f) repeating a) - e) for a second circuit design system to produce a second configuration image.

18. A method as described in Claim 17 further comprising:

downloading said first configuration image into a memory space of said electronic device; and

downloading said second configuration image into another memory space of said electronic device.

19. A method as described in Claim 17 further comprising: making said first configuration image active in said electronic device to realize said first circuit design system in said electronic device; and

in response to an condition, making said second image active in said electronic device to dynamically realize said second circuit design system in said electronic device.

20. A method as described in Claim 17 wherein said electronic device is a programmable microcontroller comprising programmable analog and digital resources.

21. A method as described in Claim 17 wherein said a) - e) are performed by a software design tool operable on a general purpose computer system.